

DOCUMENT RESUME

ED 128 559

CE 007 553

TITLE Auto Mechanics. Trade and Industrial Education Trade Preparatory Training Guide.

INSTITUTION Nebraska State Dept. of Education, Lincoln. Div. of Vocational Education.

PUB DATE [73]

NOTE 33p.; For related documents, see CE 007 554-569. Appendix A, Application for Employment, may not reproduce well because of small type

EDRS PRICE MF-\$0.83 HC-\$2.76 Plus Postage.

DESCRIPTORS *Auto Mechanics; Auto Mechanics (Occupation); Behavioral Objectives; Building Trades; Curriculum; Curriculum Design; *Curriculum Guides; *Job Skills; Occupational Information; Secondary Education; State Curriculum Guides; *Task Performance; *Trade and Industrial Education

IDENTIFIERS Nebraska

ABSTRACT

One of a series of curriculum guides prepared for the building occupations cluster of the construction/fabrication occupational group, this guide identifies the essentials of the auto mechanics trade as recommended by successful auto mechanics. An instructional program based upon the implementation of the guide is expected to prepare a student to adequately perform entry level tasks required of an auto mechanic or to enter a post-secondary technical or apprenticeship program in auto mechanics where additional depth can be realized. Trade tasks or information are listed in chart form under the headings of accessories; basic understanding; carburetor; cooling; drive train; engine; equipment and tools; ignition; lighting and signal; wheels, suspension, brakes and steering. Space is provided on the charts to record for each item the date completed, teaching methods used, and teaching materials used. Also included are a list of teacher responsibilities, sources of occupational guidance information, recommended tests and references, and a chart depicting the total construction/fabrication occupational curriculum. A typical application for employment and a sample trade and industrial education injury report are appended. (HD)

* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *

ED128559

TRADE AND INDUSTRIAL EDUCATION

TRADE PREPARATORY TRAINING GUIDE

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIGIN-
ATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT
OFFICIAL NATIONAL INSTITUTE OF
EDUCATION POSITION OR POLICY

AUTO MECHANICS

NEBRASKA DEPARTMENT OF EDUCATION
Cecil E. Stanley, Commissioner
Glen H. Strain, Assistant Commissioner

Division of Vocational Education
233 South Tenth Street
Lincoln, Nebraska 68508

CE007553

CE 207 452

TABLE OF CONTENTS

Board Members	2
Definitions Used In This Guide	3
Occupational Analysis Chart	4
Introduction	4-5
The Auto Mechanics Guide	6
Use Of This Guide	7
Teacher Responsibilities*	8-9
Auto Mechanics Content	10-25
Appendix A	26-27
Appendix B	28-29
Recommended Texts and References	30

NEBRASKA STATE BOARD
OF VOCATIONAL EDUCATION

Board Members

Gerald T. Whelan, Pres.	Mrs. Marilyn Fowler, Vice Pres.
Frank E. Landis	Willard H. Waldo
R. Jerry Hargitt	Mrs. Shirley A. Peterson
Walter L. Moller	F. Y. Knapple

Nebraska Department of Education
Division of Vocational Education

Mr. Cecil E. Stanley Commissioner of Education	Mr. Glen H. Strain Assistant Commissioner Vocational Education
Mr. Walter E. Erdkamp Administrative Director Trade & Industrial, Technical and Health Occupations Ed.	
Mr. Lloyd D. Mather, Consultant Trade and Industrial Education	
Mr. Elton B. Mendenhall, Director Nebraska Research Coordinating Unit	

Nebraska Technical Competency Project Staff
Center for Vocational and Technical Education
Kearney State College

Dr. L. Dean McClellan	Dr. James A. Miller
-----------------------	---------------------

Graduate Assistants

Mr. Larry Kness	Mr. Michael Kenny
-----------------	-------------------

CONTRIBUTORS

Mr. Norman Gibbs Kearney, Nebraska	Gilbert's Auto Repair Hastings, Nebraska
Mr. Cletus Scholl Columbus, Nebraska	Herb's Garage Hastings, Nebraska
Mr. Walt Dannull Holdredge, Nebraska	Kearney High School Kearney, Nebraska

DEFINITIONS USED IN THIS GUIDE

Major Occupational Group

A grouping of similar and related occupational area clusters. These groups include occupations that have been determined to be the most relevant and pertinent for inclusion in vocational education in Nebraska.

Occupational Area Clusters

These clusters are distinguishable in terms of similar work performed, materials used, products produced, and/or services rendered. They include a wide variety of common occupational skills and knowledge.

Occupation

The career or employment engaged in by an individual for remuneration. This activity includes technical competencies and related technical information often referred to as one's vocation.

Technical Competency

The specific tasks required for a vocational trade and industrial graduate to perform successfully at the entry level in an occupational area. These technical competencies apply to the psychomotor domain and include elements which emphasize motor skills such as: operate a machine; measure; etc.

Related Technical Information

The information the entry level worker must know in order to make appropriate trade decisions which will allow him to adequately perform the tasks or technical competencies of his occupation. This information applies to the cognitive domain and includes elements which are intellectual outcomes such as: knowledge and understanding.

Related General Information

Information which is desirable and good for the tradesman to know but which is not necessary to do his work properly; information that is nice to know, such as the history and development of his trade.

Related Guidance Information

Information that helps the student choose, prepare for, secure, hold, and make progress in an occupation.

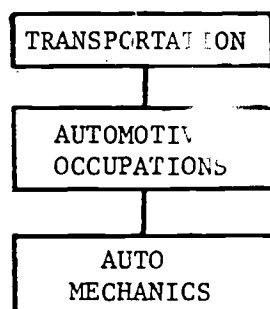
Entry Level

The technical competencies and related technical information deemed necessary by industry for obtaining and holding a job in a specific occupational area. This level of employment includes the technical competencies and related technical information that will be utilized by the employee within the first year of employment.

OCCUPATIONAL ANALYSIS CHART

The chart on this page shows Auto Mechanics as it relates to other occupations within the Transportation cluster. This guide is concerned with Auto Mechanics. Other guides have been prepared for other occupations and are available through the Nebraska State Department of Education.

OCCUPATIONAL ANALYSIS CHART (PROJECT MODEL)



INTRODUCTION

This curriculum guide has been prepared with the help of competent craftsmen in the Auto Mechanics trades. The funds that made this guide a reality were provided through a federal research grant in cooperation with the Nebraska State Board for Vocational Education and sponsored by the Nebraska Research Coordinating Unit.

Curriculum guides have been prepared for several trade and industrial occupational clusters from which high school teachers can develop

appropriate occupational related experiences for their students. The major occupational groups, occupational area clusters, and occupations are shown in graphic form on pages of this guide.

Selection of trades within four major occupational groups have been made based on a three year survey by the Nebraska Research Coordinating Unit on needs of Nebraska business and industry. This study has identified the occupations with the greatest need for employees. A related set of curriculum guides have been prepared for these occupations.

GUIDANCE INFORMATION

The U.S. Department of Labor has developed an extremely helpful book entitled, "Occupational Outlook Handbook". This annual publication provides a very complete description of the activities of the persons employed in the occupations represented in the Nebraska trade and industrial curriculum guides. Information concerning current and future opportunities is a major portion of this publication. Inexpensive reprints in booklet form that describe individual occupations are available through the Department of Labor. These booklets should be used by trade and industrial teachers and school guidance counselors for the most up-to-date guidance information about a particular occupation.

A listing of these reprints from the "Occupational Outlook Handbook", the order number, and price per copy is listed below for those occupations in the occupational area cluster of "Automotive Occupations".

Number	Title	Price
1700-84	Automobile Service Occupations20

THE AUTO MECHANICS GUIDE

This guide uses the title Auto Mechanics as the most logical descriptive term for identifying a particular related group of workers. Identification of specific job titles within this group would be determined by referring to the "Dictionary of Occupational Titles". The USOE classification system for coding instructional programs has assigned 620.131 and 620.381 to the instructional program, Auto Mechanics.

The information within this guide identifies the essentials of the auto mechanics trade as recommended by the successful auto mechanic. An instructional program based upon the implementation of this guide will prepare a student to adequately perform entry level tasks required of an auto mechanic or to enter a post-secondary technical or apprenticeship program in auto mechanics where additional depth can be realized.

The tasks and/or competencies identified within these covers are those agreed upon by a jury of reputable Nebraska auto mechanics. A separate group of persons directly employed within this trade in Nebraska have further verified these tasks and/or competencies. Jury members, tradesmen, and educators who contributed toward the development of content for this guide are listed in the front.

Course offerings in Trade and Industrial Education in Nebraska are to be organized within two period blocks of time each day, five days a week. Time is to be set aside for classroom instruction directly related to manipulative laboratory instruction. The remainder of the student's school day is to be utilized for general education subjects.

USE OF THIS GUIDE

The use of curriculum guides for trade and industrial education in Nebraska secondary schools may vary greatly, depending upon the depth and breadth of each school district's vocational program. Large school districts, for example, may utilize one particular curriculum guide to develop a course in a trade area such as auto mechanics. A small school district may, on the other hand, incorporate several curriculum guides to develop a course in the automotive occupational cluster.

The manipulative content identified in this guide is deemed necessary for inclusion in a course that is designed to prepare entry level auto mechanics. While not all secondary school facilities in Nebraska are equipped to expose students to all of this content through hands-on experience, it is assumed that this content will through some media become related technical information. This will insure inclusion of all content and provide at least discussion level understanding.

This guide is written with the assumption and expectation that the related technical information necessary to perform technical competencies will be an integral part of instruction. Thus, occupational decisions that must be made by an entry level worker will be developed along with each related manipulative activity.

The auto mechanics instructor who uses this guide is responsible for including the identified related technical information as well as the identified manipulative tasks. He is also responsible for the identification of competencies pertaining to general and guidance information, even though this information is not specifically identified for him.

Definitions for various terms used in this guide are presented in the front.

TEACHER RESPONSIBILITIES*

1. Use the American Vocational Association National Safety Council's "National Standards School Shop Safety Inspection Check List" for shop safety inspections. (Available from American Vocational Association, 1510 "H" Street, N.W., Washington, D.C. 20005)
2. Use safety check list to assure safe factors exist.
3. Require students to report ALL accidents to instructor.
4. Keep complete records of ALL accidents on file.
5. Report ALL accidents to the school administrator.
6. Develop safety consciousness in the students through teacher example--always doing things in the safe way.
7. Give shop demonstrations stressing safe use of machines.
8. Give shop demonstrations stressing safe use of hand tools.
9. Provide instruction on what to do in case of an accident.
10. Develop information sheets dealing with the safe use of specific machines.
11. Give demonstrations on the proper use and care of personal protective devices.

*These responsibilities are necessary for inclusion in all trade and industry programs in the State of Nebraska.

12. Develop information sheets dealing with the general safety rules for the trade.
13. Enclose all gears, moving belts, and other power transmission devices with permanent guards.
14. Prohibit students from operating machines when instructor is not present.
15. Prohibit the removal of guards and safety devices, even for a brief period, without the approval of the instructor.
16. Prohibit more than one operator from using a machine at one time.
17. Determine personal liability factors and liability coverage afforded through your school.
18. Provide for the bulk storage of flammable materials
19. Mark the location of fire-fighting equipment.
20. Post instructions and inform students of building evacuation procedures.
21. Require the wearing of appropriate eye protection as specified by the State of Nebraska eye safety regulations.
22. Keep tools sharp, clean and in good working condition.
23. All shop personnel should be thoroughly familiar with the location of fire extinguishers and the type fire for which each extinguisher is designed.

AUTO MECHANIC
(Identified Trade Tasks or Information)

Solve fundamental hydraulics and pneumatics problems.

Demonstrate a working knowledge of basic math (add, subtract, multiply, divide).

Read and interpret volt-ohm meter.

CARBURETOR

Overhaul single barrel carburetor.

Overhaul two-barrel carburetor.

Overhaul four-barrel carburetor.

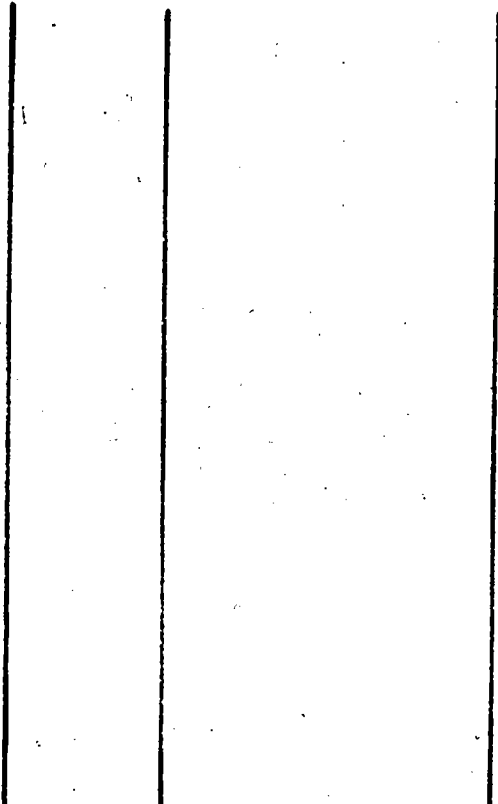
Repair automatic choke.

Replace throttle lever or seal.

TE LETED	TEACHING METHODS USED	TEACHING MATERIAL USED

Disassemble and assemble
Gemmer steering gear.

Disassemble and assemble
Saginaw recirculating ball
steering gear.



Appendix A

One of the primary objectives of trade and industrial education is the successful placement of students completing course work in a specific occupation. The following sample application form is included in this guide with the recommendation that the preparation of such forms become a necessary activity for students in all trade and industrial education courses.

APPLICATION FOR EMPLOYMENT				
PERSONAL INFORMATION				
NAME		DATE		SOCIAL SECURITY NUMBER
LAST	FIRST	MIDDLE		
PRESENT ADDRESS		STREET		CITY
PERMANENT ADDRESS		STREET		CITY
PHONE NO.		OWN HOME		RENT
DATE OF BIRTH		HEIGHT		WEIGHT
MARRIED		SINGLE		WIDOWED
NUMBER OF CHILDREN		DEPENDENTS OTHER THAN WIFE OR CHILDREN		CITIZEN OF U.S.A.
IF RELATED TO ANYONE IN OUR EMPLOY, STATE NAME AND DEPARTMENT		REFERRED BY		YES <input type="radio"/> NO <input type="radio"/>
EMPLOYMENT DESIRED				
POSITION		DATE YOU CAN START		SALARY DESIRED
ARE YOU EMPLOYED NOW?		IF SO MAY WE INQUIRE OF YOUR PRESENT EMPLOYER		
EVER APPLIED TO THIS COMPANY BEFORE?		WHERE		WHEN
EDUCATION	NAME AND LOCATION OF SCHOOL		YEARS ATTENDED	DATE GRADUATED
GRAMMAR SCHOOL				
HIGH SCHOOL				
COLLEGE				
TRADE, BUSINESS OR CORRESPONDENCE SCHOOL				
SUBJECTS OF SPECIAL STUDY OR RESEARCH WORK				
WHAT FOREIGN LANGUAGES DO YOU SPEAK FLUENTLY?				
U.S. MILITARY OR NAVAL SERVICE		RANK		PRESENT MEMBERSHIP IN NATIONAL GUARD OR RESERVES

CONTINUED ON OTHER SIDE

FORMER EMPLOYERS (LIST BELOW LAST FOUR EMPLOYERS, STARTING WITH LAST ONE FIRST)

DATE MONTH AND YEAR	NAME AND ADDRESS OF EMPLOYER	SALARY	POSITION	REASON FOR LEAVING
FROM				
TO				
FROM				
TO				
FROM				
TO				
FROM				
TO				

REFERENCES: GIVE BELOW THE NAMES OF THREE PERSONS NOT RELATED TO YOU, WHOM YOU HAVE KNOWN AT LEAST ONE YEAR.

	NAME	ADDRESS	BUSINESS	YEARS ACQUAINTED
1				
2				
3				

PHYSICAL RECORD:
LIST ANY PHYSICAL DEFECTS

1. HAVE YOU EVER INJURED? _____ GIVE DETAILS _____

HAVE YOU ANY DEFECTS IN HEARING? _____ IN VISION? _____ IN SPEECH? _____

IN CASE OF
EMERGENCY NOTIFY _____

NAME _____ ADDRESS _____ PHONE NO. _____

I AUTHORIZE INVESTIGATION OF ALL STATEMENTS CONTAINED IN THIS APPLICATION. I UNDERSTAND THAT MISREPRESENTATION OR OMISSION OF FACTS CALLED FOR IS CAUSE FOR DISMISSAL. FURTHER, I UNDERSTAND AND AGREE THAT MY EMPLOYMENT IS FOR NO DEFINITE PERIOD AND MAY, REGARDLESS OF THE DATE OF PAYMENT OF MY WAGES AND SALARY, BE TERMINATED AT ANY TIME WITHOUT ANY PREVIOUS NOTICE.

DATE _____ SIGNATURE _____

DO NOT WRITE BELOW THIS LINE

INTERVIEWED BY _____ DATE _____

REMARKS:

NEATNESS		CHARACTER	
PERSONALITY		ABILITY	

HIRED	FOR DEPT.	POSITION	WILL REPORT	SALARY WAGES
APPROVED 1.	2.	3.		
EMPLOYMENT MANAGER	DEPT. HEAD	GENERAL MANAGER		

Appendix B

One of the most important parts of any trade and industrial education course is a safety program. The following form is recommended for use in courses of this type.

SAMPLE TRADE AND INDUSTRIAL EDUCATION INJURY REPORT* **

Student injured _____ Date _____

Shop in which accident occurred _____ Time _____

Instructor in charge _____

Nature of injury _____

First aid administered _____

By whom? _____

Cause of injury _____

Could injury have been prevented? _____ How? _____

Action taken or recommendations made to prevent recurrence _____

Remarks: _____

Signed _____
(Person making report)

Witnesses: _____

Names _____

and

Addresses _____

- *Complete in Duplicate
- **File one copy in office

FORMER EMPLOYERS (LIST BELOW LAST FOUR EMPLOYERS, STARTING WITH LAST ONE FIRST)

DATE MONTH AND YEAR	NAME AND ADDRESS OF EMPLOYER	SALARY	POSITION	REASON FOR LEAVING
FROM				
TO				
FROM				
TO				
FROM				
TO				
FROM				
TO				

REFERENCES: GIVE BELOW THE NAMES OF THREE PERSONS NOT RELATED TO YOU, WHOM YOU HAVE KNOWN AT LEAST ONE YEAR.

	NAME	ADDRESS	BUSINESS	YEARS ACQUAINTED
1				
2				
3				

PHYSICAL RECORD:

LIST ANY PHYSICAL DEFECTS

WERE YOU EVER INJURED? _____ GIVE DETAILS: _____

HAVE YOU ANY DEFECTS IN HEARING? _____ IN VISION? _____ IN SPEECH? _____

IN CASE OF
EMERGENCY NOTIFY _____ NAME _____ ADDRESS _____ PHONE NO. _____

I AUTHORIZE INVESTIGATION OF ALL STATEMENTS CONTAINED IN THIS APPLICATION. I UNDERSTAND THAT MISREPRESENTATION OR OMISSION OF FACTS CALLED FOR IS CAUSE FOR DISMISSAL. FURTHER, I UNDERSTAND AND AGREE THAT MY EMPLOYMENT IS FOR NO DEFINITE PERIOD AND MAY, REGARDLESS OF THE DATE OF PAYMENT OF MY WAGES AND SALARY, BE TERMINATED AT ANY TIME WITHOUT ANY PREVIOUS NOTICE.

DATE _____ SIGNATURE _____

DO NOT WRITE BELOW THIS LINE

INTERVIEWED BY _____ DATE _____

REMARKS: _____

NEATNESS		CHARACTER	
PERSONALITY		ABILITY	

NINEO FOR DEPT POSITION WILL REPORT SALARY
WAGES

APPROVED 1. _____ 2. _____ 3. _____
EMPLOYMENT MANAGER DEPT. HEAD GENERAL MANAGER

RECOMMENDED TEXTS AND REFERENCES

Auto Mechanics

Bibliography

- Bohn, Ralph C. and Mac Donald Angus J. Power: Mechanics of Energy Control. Bloomington, Illinois: McKnight & McKnight Publishing Company, 1972.
- Crouse, William H. Automotive Mechanics. New York: McGraw-Hill Book Company, 1970.
- Ellinger, Herbert E. Auto Mechanics. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1972.
- Purvis, Jud Automatic Transmissions. Chicago: The Good Heart-Willcox Company, Inc., 1950.
- Stephenson, George E. Power Technology. Canada: Delmar Publishers, Inc., 1968.
- Stockel, Martin W. Auto Mechanics. Homewood, Illinois: The Good Heart-Willcox Company, Inc., 1963.
- Toboldt, William K. and Purvis, Jud Automotive Encyclopedia. Chicago: The Good Heart-Willcox Company, Inc., 1964.
- U.S. Department of Labor Job Corps Training Standard for Automotive Service Repairman. Washington, D.C., August 1969.
- Mechanical Power Transmission. Chicago: American Oil Company, March 1962.
- 1973 Pontiac Service Manual. Michigan: General Motors Corporation.

OK- 007-553

Vocational Instructional Materials for Trade and Instructional Materials Occupations. Washington, D.C.: U.S. Government Printing Office, Stock No. 1780-0842, 1971. (This book of curriculum materials lists innumerable sources of great value to the T & I teacher. These free or inexpensive materials have been printed by the U.S. Government Printing Office. Your copy of this catalog will cost \$1.50 and is available from the following address:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20000)